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TIME TO ASSESS LEARNING OUTCOMES IN E-LEARNING – TALOE WEB TOOL

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Abstract

TALOE (Time to Assess Learning Outcomes in E-learning) is a two-year project co-funded under the European Commission's Lifelong Learning Programme, approaching the e-assessment concept by using technology for assessing students' learning.

TALOE's main goal is to develop a web-based platform to help teachers and trainers decide which e-assessment strategies to use in their online courses. This tool is aimed to raise teachers' awareness about the variety of e-assessment strategies in order to improve the quality of the learning process. The main idea is that teachers will describe the learning outcome of their course or module and the TALOE platform will analyse them and provide a suitable e-assessment strategy that is consistent with the intended learning.

In this paper achieved results in the project so far will be presented, with the emphasis on the development of the TALOE web tool.

TALOE project: Time to Assess Learning Outcomes in e-learning

The project *Time to Assess Learning Outcomes in E-learning* – TALOE (taloe.up.pt), is financed by the European Commission for the years of 2014-15 (Ref. 543097-LLP-1-2013-1-PT-KA3-KA3MP).

The TALOE consortium consists of the following institutions:

- *Universidade do Porto* (Portugal) (coordinator)
- *Gábor Dénes Főiskola* (Hungary)
- *Sveučilišni računski centar Sveučilišta u Zagrebu* (SRCE) (Croatia)
- *Innovate4Future – Center for Advanced Educational Solutions* (I4F) (Romania)
- *Università degli Studi di Padova* (Italy)
- *European Distance and E-Learning Network* (EDEN)
- *European University Continuing Education Network* (EUCEN)
- *Hariduse Infotehnoloogia Sihtasutus* (HITSA) (Estonia)

- *Universidad Nacional de Educación a Distancia (UNED) (Spain)*

The project builds on the foundations of two previous projects:

- an existing model for the Alignment of Learning Outcomes and Assessment, the ALOA model, which uses the revised version of Bloom's Taxonomy to establish the link between the Learning outcomes and general assessment methods (Anderson, Krathwohl & Bloom, 2001; Falcão, 2013). The TALOE project uses the same methodology but by adapting it to the specific context of e-learning and e-assessment.
- the outcomes of the VIRQUAL project (<http://virqual.up.pt/>), in particular the template for describing the learning outcomes (Csanyi & Yilmaz, 2009)

The TALOE project intends to materialize the application of the ALOA tools to the specific context of e-learning. The main goal of TALOE is to develop a web-based platform to help teachers and trainers decide on the e-assessment strategies to use in their online courses. The rationale of TALOE is that a teacher/trainer will describe the learning outcome of the course or module and the TALOE platform will analyse them and provide an e-assessment strategy that is consistent with the set of intended learning outcomes.

In the process of the development of the practical tool the TALOE consortium is performing the following specific tasks:

- Research and selection of innovative e-assessment practices that take advantage of the use of technology.
- Development of a web-based tool that is easy to use by the stakeholders.
- Testing of the implementation of the tool with real case studies.

Along with development of the web tool, the project has established the web pages where all the information about the project is available to community (taloe.up.pt). The project web pages also provide the resources related to the project objectives: learning outcomes, assessment methods and so on. Information about the project is disseminated through the TALOE mailing list and presence on the social networks. Additionally, three leaflets have been published till now and distributed to the academic community, especially at the project partner institutions. The new leaflet is due in the middle of the April. The project newsletter has been published periodically as well and brings the information about the project current progress and achieved results.

During the project the important task is to establish the network of the people and institutions interested in the project results, and to identify and reach the potential stakeholders interested in the project who will use the benefits of the project in order to promote it and implement it in the academic community as the valuable tool in the process of education quality improvement.

Background and conceptual framework

Assessment is a crucial process in education. To be valid, assessment should be consistent with the intended objectives of learning activity. The learning process is very complex in all its components: clear definition of the intended student learning outcomes, definition of adequate learning activities and selection of assessment practices that address what is expected from the students. The use of e-learning in learning and assessment brings an additional level of complexity to the process. TALOE intends to provide a practical web solution to some of these issues, based on tools developed previously.

Learning outcomes have been widely adopted in education with different roles. They were used to describe the competences of the individual after the training, with the goal of improving the dialogue with potential employers. The adoption of learning outcomes in higher education in Europe is associated with European policies with impact on national policies and on higher education institutions and are usually interpreted as what a student is expected to be able to do as a result of a learning activity. There are different roles or applications for the learning outcomes:

- a descriptor of the qualifications acquired for improving mobility and employability of individuals;
- a descriptor in processes of recognition of prior learning for improving access to education institutions and validation of competences;
- a criteria for quality assurance systems and accreditation processes of higher education institutions;
- a structuring role in educational systems, used as descriptor used in qualification frameworks at international, national and sector levels;
- a structuring role at the institutional level, used as a multi-level descriptor in programmes inside the institutions;
- a communication tool between teachers and learners, as a descriptor of the goals of a course or unit.

Learning outcomes are also becoming fundamental for structuring the standards and guidelines of quality assessment of higher education and continuing education institutions in Europe and worldwide. In this context, the assessment of learning outcomes becomes a crucial process for the educational system. It should be a major concern of educational institutions to ensure that assessment of student learning is being guided by what they should be learning, i.e. assessment should be consistent with the intended learning outcomes.

Concerning e-assessment, it is considered that is a critical part of e-learning, the same way assessment is critical to traditional learning. The general concept of e-assessment is herein broadly defined as using technology for assessing students learning. Furthermore, the impact of information and communication technologies (ICT) on education has to be taken into account. The use of ICT applied to education, e-learning etc. has been increasing and its use creates new opportunities for teaching, learning and assessment and has huge potential as an answer to some of the current challenges of education. The change to the digital media has

impact on the availability, reusability, accessibility and cost of learning resources, complemented by the communication and networking potential of the Internet that takes education to a global level. The application of ICT in education and in particular in assessment is a subject of great discussion. Some of the issues related with the use of e-learning in assessment are related with validity and reliability of the process.

For the alignment of learning outcomes and e-assessment, TALOE has adapted and developed another tool, the ALOA model. The ALOA conceptual model (Aligning Learning Outcomes and Assessment) highlights the connection between the intended learning outcomes and the assessment strategy used during a course. To ensure the validity of assessment in relation to what is intended from the course, it is necessary that the outcomes measured by the assessment tasks are the same as the ones expressed in the learning outcomes statements. This is the main principle that supports the ALOA model. It uses the revised version of Bloom's Taxonomy to establish the link between the learning outcomes and following six general assessment methods each with subcategories:

- multiple choice question;
- essay;
- problem solving;
- practical work;
- short answer questions;
- reflective practice assignments.

The final lists of these methods were obtained from the literature research (Anderson, Krathwohl & Bloom, 2001; Biggs & Tang, 2007; Bloom, 1956; Boud & Falchikov, 2006; Falcão, 2013), especially from Brown, Bull and Pendlebury (1997). It was considered that the list includes most assessment methods but it is assumed that there are assessment tasks that might not easily be included in these categories.

The ALOA model also proposes different scenarios of application that allow the model to be used to verify the consistency of the courses or to propose new assessment strategies that are linked with the learning outcomes statements of the course or module. It is a fact that not all assessment methods are valid for each type of the learning outcomes. The ALOA model provides tools for linking learning outcomes and assessment tasks.

E-assessment practices: selection and analysis

In the first project year the project was at a stage where the activities were targeted at identifying and defining selection criteria for innovative and effective e-assessment practices. Instead of listing different methods the focus was on things that trigger a shift in what is actually assessed, how it is assessed and discard practices where the only aspect which is “innovative” is the method itself. These shifts can be generally described as follows:

- a shift from the testing of discrete, de-contextualised elements of knowledge and skill to the assessment of more holistic, complex activities using knowledge and skills in problem-solving or authentic tasks;
- a shift from highly standardised and controlled testing methods which result in quantitative scores and where assessment is strongly separated from teaching and learning to a more diverse range of assessment methods, resulting in qualitative descriptions or judgements and where assessment is often integrated with teaching and learning and may involve students as active participants;
- a shift from identifying and categorising underlying ability or ‘intelligence’ and ranking student performance in relation to their peers to identifying and describing achievements according to relevant criteria and standards.

In order to identify suitable criteria matching these shifts it became evident that the emphasis had to be placed on concentrating on more general approach starting with the assessment type. This meant eliminating criteria associated with “norm-referenced assessment” practices and focusing on criteria that characterise “criterion-referenced assessment” practices, i.e. casting aside situations where assessment is based on making judgements about people (e.g. ranking students based on distribution of scores) and instead concentrating on judgements about performance (e.g. assessing the extent to which learning outcomes are met). And only then considering other aspects such as the assessment methods which might be deemed innovative (using concept maps, wikis, portfolios, learning analytics, simulations etc.). Based on the above and following the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ENQA, 2009), an initial list of criteria for identifying innovative assessment practices was drawn up.

The result was collection of 18 cases of assessment of online courses from different institutions around Europe, mostly from the project partners (Lössenko, 2014). These case studies were analyzed by the partnership in terms of classification under two perspectives: these were classified in terms of learning outcomes definition and in terms of the assessment modes used to verify these learning outcomes. The case studies classifications were also revised by the partnership during a second round.

The goals of this work were to obtain examples of case studies that can be used as a showcase of current practice and also as testing material during the second year of the project (see, for example, Gil-Jaurena, Aguado, Malik & Cucalón, 2015). Since these case studies are available to the partnership these can be scrutinized during the tuning of the web-tool. Another result refers to the ALOA model with integration of e-assessment practices, which was developed on

a second stage of the research component where the consortium developed an extension of the ALOA model to include the e-assessment practices described in the case-studies. This outcome generated the list of e-assessment methods to be considered in the web-tool.

Web-based tool

After the definition of the extended ALOA model and setting of the matrix which is aligning the cognitive processes describing the learning outcomes and the categories of the e-assessment methods the next step was to develop the web-based platform that will help teachers and trainers decide on the e-assessment strategies to use in their online courses. The main idea for development of this web tool was that a teacher will describe one learning outcome of their course or module and the TALOE web tool will analyse it and offer the most appropriate e-assessment methods that are consistent with the intended learning.

The first task was to define the matrix behind the tool. The matrix is aligning the six categories of the cognitive process dimension and relative cognitive processes with defined six categories. The categories of cognitive process dimension range from the cognitive processes most commonly found in learning outcomes, those associated with Remember, Understand and Apply to those less frequent like Analyze, Evaluate and Create. Each of these six major categories is associated with two or more specific cognitive processes, also described by verb forms.

The partnership has produced a first version of the web-tool at the beginning of the year 2015 and started with testing for the first functionalities of the intended platform (Figure 1). The development and consequent testing will be done in phases of complexity of the definition of the procedures relating learning outcomes and assessment methods. This is an extra effort to achieve consistency of the web-tool performance and simplicity of procedures by potential users. Due to the complexity of the ALOA model it was decided to simplify the tool procedures during a first phase of testing it. The first phase addresses only the simplest forms of knowledge. After initial testing of the matrix it has been confirmed that the matrix is working properly. The best (most appropriate) e-assessment methods are selected on the base of the absolute matches between input (learning outcome) and the e-assessment method.

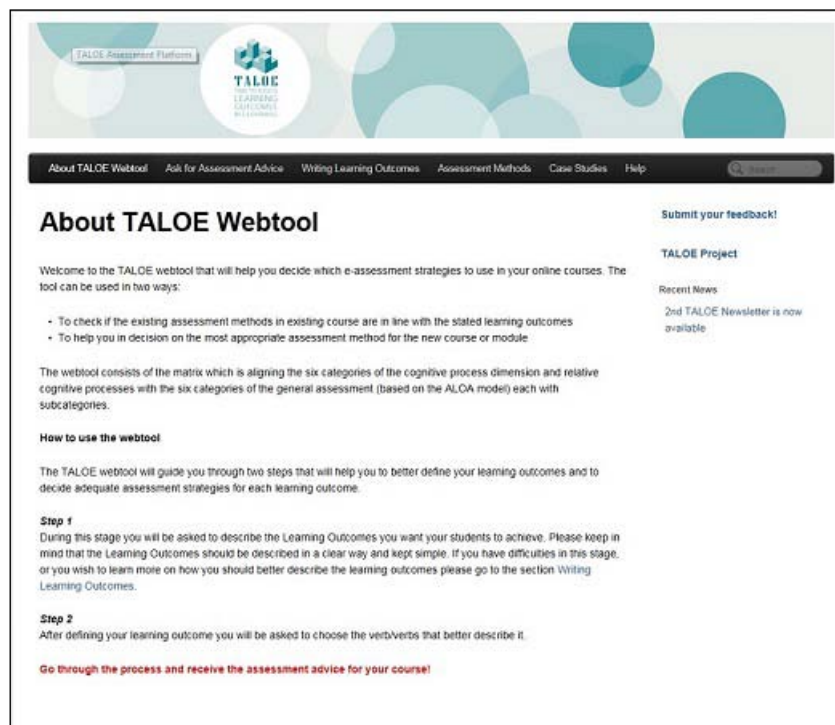


Figure 1. Main page of the TALOE web tool (taloe.innovate4future.eu)

Further testing was done with collected case studies to see if the suggested e-assessment methods are closely related to defined learning outcome. The results showed that the majority of the teachers have planned assessment methods such as: forum discussions, written assignments and online tests, self-evaluation tests and some practical activities. The suggested e-assessment methods (by TALOE web tool) in some cases suggested additional possibilities of the assessment but in some cases indicated that the existing assessment methods should be revised.

These results confirmed intended and planned task that the web tool also provides support and guidance to teachers to formulate the learning outcomes in accordance to Bloom taxonomy increasing this way the accuracy of the learning outcome received by tool.

When describing the learning outcome, teacher chooses up to three verbs that will best describe the learning outcome. This step also enables the user to check the defined learning outcome. After describing the learning outcome with verbs, teacher set the process in action and receives the assessment advice for the defined learning outcome (Figure 2). The tool also provides the description of each suggested e-assessment methods. The basic info about the learning outcome and the ALOA model are available as well. So, the TALOE web tool can be used in two ways: to check if the existing assessment methods in existing course are in line with the stated learning outcomes and to help user in decision on the most appropriate assessment method for the new course or module.

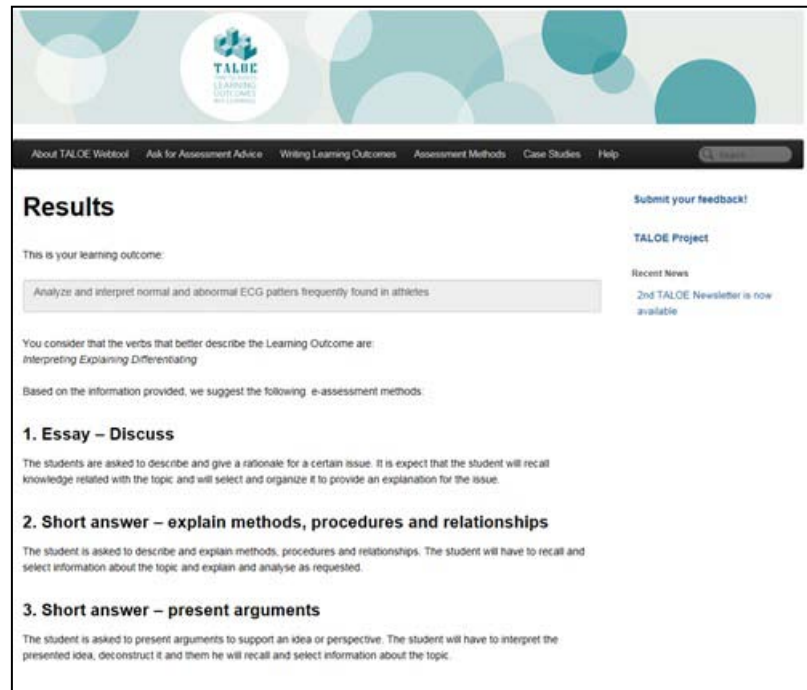


Figure 2. TALOE web tool – results page

At the moment in the process is testing by invited stakeholders to get their feedback on the relevance and usability of the tool. Based on their comments and information additional adjustments of the tool will be made.

The aim is to develop an interactive website that will provide a service to teachers and trainers of different learning context. It is intended that the TALOE web tool will be freely available to use publicly and will be of help to any person concerned in finding the solutions for assessment.

Conclusion

The second year of the project plans to focus on the two remaining objectives of TALOE:

- to test the implementation of the tool with the set of collected case studies and with other case studies from other courses;
- to distribute, to disseminate and to explore the TALOE web-tool among the communities of stakeholders.

Following the testing of the web-tool by the partnership and invited stakeholders, the plan is to adapt the web-tool to the decisions. Also some organizations and experts will be directly contacted and invited to cooperate in this testing. It is relevant to consider the increase of the accuracy of the tool, the interface with users, the cultural diversity, the language issues and the scope of users. After that adaptation and improvement the web-tool will be tested on a wider scale using the networking and the partnerships established. The final phase, envisaged for the last quarter of the year, will be dedicated to reach a larger audience in terms of dissemination and of exploration of results.

Some activities are related with dissemination and exploration like:

- collection of related news to be published on the project and partners' websites and in social networks;
- contacting directly stakeholders that are related decision makers, accreditation organizations, qualification bodies and quality assurance agencies;
- elaborating newsletters and leaflets that will be distributed via the partners' lists and via the engaged organizations;
- organization of TALOE webinars on the monthly base (third Wednesday at 11 o'clock CET);
- publication of papers in conferences and in journals with the results arising from the project implementation;
- organisation of a conference with an intended European audience aiming at presenting the web-tool.

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